AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A controller system for use in a subterranean well comprising:
a controller located in the well; and
a signal source capable of putting a command signal into the well;
wherein the controller ~~distinguishes an *a priori* unknown, but repeating command signal~~ is responsive to a repeating command signal, the command signal previously unknown to the controller, the controller responsive to the repeating command signal by actuating a tool.

2. (Original) The controller system of claim 1 in which the controller further comprises:
a memory unit;
a microprocessor;
a buffer;
an analog-to-digital converter; and
a downhole tool interface.

3. (Original) The controller system of claim 1 in which the signal source provides a pressure sequence.

4. (Original) The controller system of claim 1 in which the signal source provides an acceleration.

5. (Original) The controller system of claim 1 in which the signal source provides variable flow rates of fluid.

6. (Original) The controller system of claim 1 in which the signal source provides variations in applied force.

7. (Original) The controller system of claim 1 in which the signal source provides variations in stress or strain.

8. (Original) The controller system of claim 1 in which the controller uses at least one computed parameter to distinguish the command signal.

9. (Original) The controller system of claim 8 in which the controller further comprises a buffer to store data used to create a first profile and a second profile, and in which the at least one computed parameter includes the correlation coefficient between the first profile and the second profile.

10. (Currently Amended) A controller for use in a subterranean well comprising:
a memory unit;
a microprocessor;
a buffer;
an analog-to-digital converter; and
a downhole tool interface;
in which the microprocessor executes a program stored in the memory unit to determine whether to initiate the downhole tool interface based on the recognition of ~~an *a priori*~~ a previously unknown~~, but repeated~~ command signal, the microprocessor recognizing the command signal in response to detecting that the command signal has been repeated.

11. (Original) The controller of claim 10 in which the command signal is sampled by the analog-to-digital converter and the samples are stored in the buffer.

12. (Currently Amended) The controller of claim 11 in which a portion of the samples stored in the buffer represent ~~the initial~~ a first command signal and a portion of the samples in the buffer represent ~~the repeated~~ a repetition of the first command signal.

13. (Currently Amended) The controller of claim 12 in which the recognition is based on a comparison of the samples representing the ~~initial~~ first command signal to the samples representing the ~~repeated~~ repetition of the first command signal.

14. (Original) The controller of claim 10 in which the recognition is based on a computed parameter.

15. (Original) The controller of claim 14 in which the computed parameter is a correlation coefficient.

16. (Currently Amended) A method to determine whether ~~an *a priori* unknown, but repeating~~ a previously unknown command signal has been issued into a well comprising:
taking data samples at a desired location in the well;
storing the data samples in a buffer;
computing parameters using the data samples in the buffer;
comparing the computed parameters to pre-defined tolerances; and
deciding whether a command signal was issued based on the comparison results.

17. (Original) The method of claim 16 in which the computing parameters includes computing a first and second mean, a first and second standard deviation, and a correlation coefficient.

18. (Currently Amended) A method to control a downhole tool in a subterranean well comprising:
placing a controller in a desired location in the well;
sending a repeating signal from a signal source to the controller;
recording samples while the signal is being sent in a buffer in the controller to create upper and lower profiles in the buffer;
comparing the upper profile to the lower profile to determine whether the profiles constitute a match, wherein the match indicates the repeating signal is a command signal, wherein the command signal was previously undefined at the controller; and
initiating actuation of the downhole tool if [[a]] the match is found.

19. (Original) The method of claim 18 in which the comparing includes computing a correlation coefficient.

20. (Original) The method of claim 18 in which the comparing includes comparing the mean and standard deviation of the upper profile to the mean and standard deviation of the lower profile.

21. (New) The controller system of claim 1, wherein the controller recognizes the command signal in response to detecting a first occurrence of the command signal and repetition of the command signal.

22. (New) The controller system of claim 21, wherein the controller autocorrelates a first waveform representing the first occurrence of the command signal with a second waveform representing the repetition of the command signal.

23. (New) The controller system of claim 1, wherein the command signal previously unknown to the controller is a pressure profile, and wherein the controller recognizes the pressure profile by detecting a first occurrence of the pressure profile and a repetition of the pressure profile.

24. (New) The controller of claim 10, wherein the microprocessor recognizes the command signal in response to detecting a first occurrence of the command signal and repetition of the command signal.

25. (New) The controller of claim 10, wherein the command signal previously unknown to the microprocessor is a pressure profile, and wherein the microprocessor recognizes the pressure profile by detecting a first occurrence of the pressure profile and a repetition of the pressure profile.

26. (New) The method of claim 16, wherein taking the data samples comprises:
taking a first sample representing a first occurrence of the command signal; and
taking a second sample representing a second occurrence of the command signal.

27. (New) The method of claim 16, wherein the taking, storing, computing, comparing, and deciding acts are performed by a controller, and wherein the command signal was previously unknown to the controller.